Commentary: Orbitozygomatic Craniotomy for Clipping a Complex Middle Cerebral Artery Aneurysm: 2-Dimensional Operative Video

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Received, August 27, 2019.
Accepted, September 2, 2019.
Published Online, November 23, 2019.

Surgical interventions for intracranial aneurysms (ICAs) developed dramatically. One of the big steps in neurosurgical evolvement was the introduction of the operating microscope and advances in surgical equipment. After using the microscope in neurosurgical operations by Yasargil and his introduction of pterional craniotomy for clipping most ICAs around the circle of Willis, the outcomes of the ICA surgery were obviously improved.[1] The orbitozygomatic craniotomy (OZC) is best suited for deeper and more complex middle cerebral artery (MCA) bifurcation aneurysms. Nowadays, microsurgical clipping techniques such as simple clipping, fenestration, overlapping clipping, and tandem clipping and clip configurations such as standard, straight, curved, and fenestrated clips were also well-established.

New microsurgical equipment is simple to use in neurovascular surgeries and well-described for anatomical dissection, parent vessel manipulation, aneurysm exposure, proximal-distal control, and neck dissection, to facilitate complex neurovascular surgeries.[3] Furthermore, advances in integrated analytical visualization tools such as indocyanine green videoangiography (ICG-VA) and advances in open aneurysm surgeries make these surgical interventions less invasive, more appealing to patients, and effective for deeper and more complex aneurysms such as those for which treatment via endovascular approaches failed, and these advances minimize surgical risks and reoperation rates. Despite the increasing refinements in endovascular and embolization techniques, several recently published studies pointed out that it is no longer good enough for neurovascular surgeons to achieve acceptable results with comparable complications.[2-5]

The MCA territory is a major location of approximately 30% of all ruptured ICAs and 36% of all unruptured ICAs.[4-6] MCA aneurysms are usually located at the MCA bifurcation and almost project laterally in the M1 segments plane. Clipping MCA bifurcation aneurysms poses a real surgical challenge because of their location and lateral projection, the attachment of the dome to the temporal lobe, and the presence of intracerebral hematoma in most MCA-originated aneurysmal subarachnoid hemorrhage cases. However, the prognosis of such ICAs is poor. The success of microsurgical clipping of these aneurysms depends on several factors such as a complete obliteration of the aneurysm from the circulation with the patency of parent vessels or perforators, the presence of intracerebral hematoma, the patient's clinical status at presentation, an extensive manipulation of parent vessels, and an uncontrolled long retraction. Complete obliteration can be possible only with a full exposure of proximal and distal sides of originating vessels.

Over the last decade, popularized ICG-VA has been used to examine intraoperatively microsurgical clipping by detecting the residual aneurysms, parent vessels, branching and perforators compromised by the clip, or persistent aneurysm filling due to incomplete clipping.[7,8]

Spetzler is one of the pioneers in the field of neurovascular surgery. In this video, Spetzler and Hendricks[9] present the advantages that can be obtained via OZC for the obliteration of a complex MCA M1 bifurcation aneurysm. We can summarize these advantages in providing multidirectional viewing of the aneurysmal neck and dome, minimizing cerebral cortex retracting as it allows a gravitational retraction of the frontal and temporal lobes, reducing aggressive manipulations as it enables access to the aneurysmal dome and proximal-distal control via the shortest possible distance from the surface, and good surgical freedom in vertical-horizontal angles of surgical attacks.[3] According to our experience, we prefer OZC for MCA bifurcation aneurysms, unless there are any obstacles. The video shows

an obliteration of the left-sided wide-necked bilobed MCA M1 bifurcation via OZC using a single curved clip. ICG-VA shows the full obliteration with the patency of parent vessels.

I would thank Drs Hendricks and Spetzler for their participation[9] with their valuable experience. I recommend these videos for education, especially for neurosurgical residents and trainers. In these videos, the authors provide educational video demonstrations of Spetzler's technical principles. These tenets provide a strong foundation for performing a broad array of neurosurgical interventions.[9] However, this video could be better if it pointed out some concerns such as the craniotomy procedure (mini or conventional), brief points about dissection and parent vessels' manipulation to avoid extensive retraction, and presentation of patient cosmetic results after surgery.

Disclosures

The author has no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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